

## Summer Research Program 2011/2012

### *Micro-climatic effects of vegetated roofs*

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#### Objective

*The aim of this project is to study the possible impact of vegetated roofs on the local micro-climate. Data to quantify the energy balance of different types of experimental roofs have been collected in the past year and will be analysed within this project.*

#### Description

With the worldwide growing urbanisation rates, cities have started to invest in green infrastructures, with the aims, among others, to limit temperature peaks and help offset greenhouse-gas emissions. Because it is not always feasible to introduce new green areas within existing densely populated urban landscapes, green or vegetated roofs are becoming increasingly popular in Australia.

The vegetated soil media above the roof affects the local energy balance, with changes in evapotranspiration and heat transmitted through to the building underneath. These changes in the local energy balance are going to modify the local temperatures with possible



Figure 1. Two roof configurations monitored during the experiment: a vegetated (left) and an impervious roof (right).

benefits in reducing the so-called 'urban heat island' effect, i.e., higher temperatures, especially at night, in urbanised areas when compared to the surrounding rural areas.

Data of the main components of the energy balance have been collected in the past year using rigs, installed on Clayton campus, representing different types of roofs, vegetated and traditional (Figure 1). This project aims to continue the collection of data and to analyse the existing measures to identify the potential impact of green roofs on the local micro-climate.

In the project, students will become familiar with *i)* methods to measure continuously environmental variables (equipment used and data logging) and *ii)* methods to perform data analysis of environmental quantities.

**Requirements:** familiarity with the basics of softwares used for statistical analysis of large data-sets (Matlab or R).